Robert C. Colwell, Reg. No. 27,431   *(650) 326-2400*

Applicant: Yoichi Mizuno, *et al.*
Title: ●rray System Capable for Taking Over Volumes B●●n...
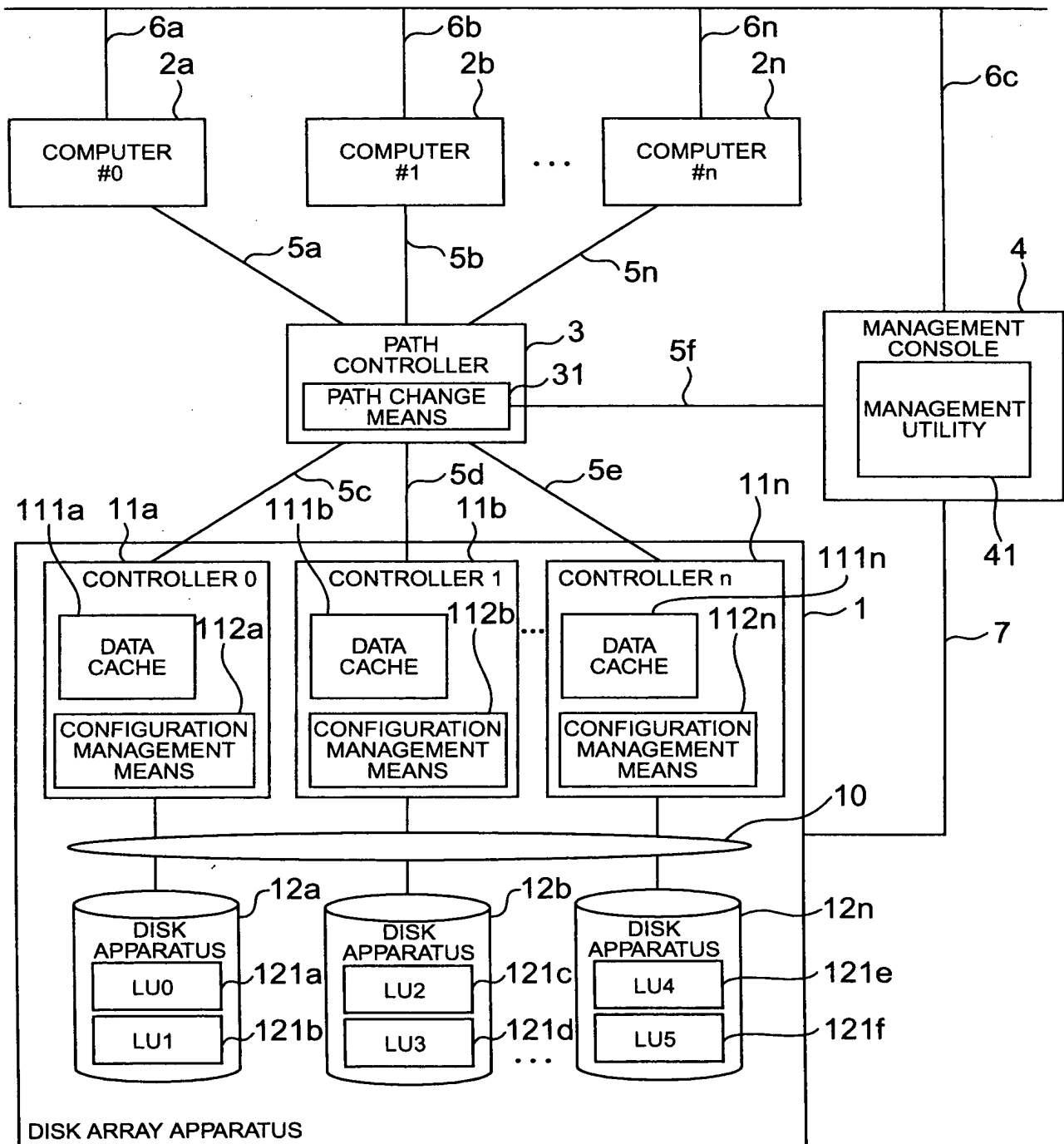**Atty Docket No.** 16869S-043800
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FIG. 1

FIG. 2

CONFIGURATION INFORMATION TABLE

1121

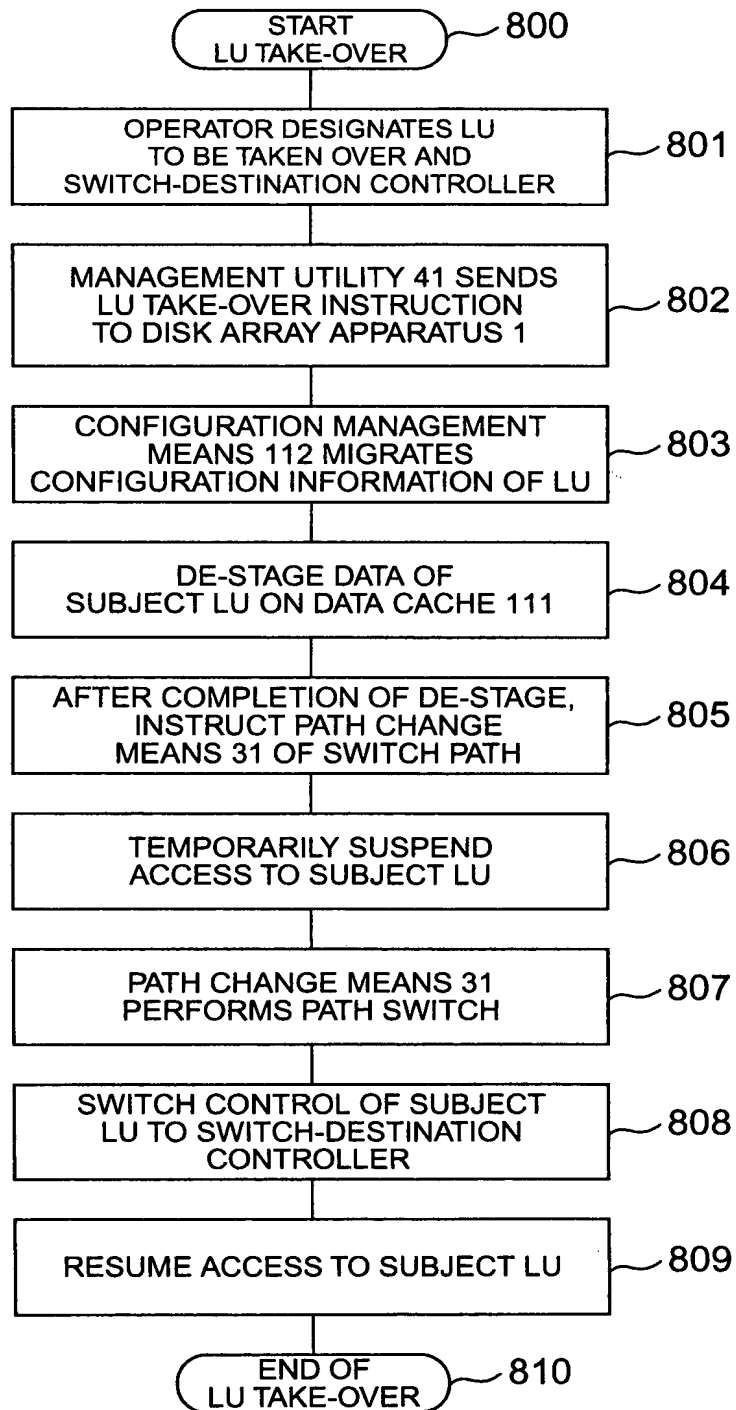| INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

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FIG. 3

```
        ( START          )──── 800
        ( LU TAKE-OVER    )
                │
    ┌───────────────────────────┐
    │ OPERATOR DESIGNATES LU     │──── 801
    │ TO BE TAKEN OVER AND       │
    │ SWITCH-DESTINATION CONTROLLER │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ MANAGEMENT UTILITY 41 SENDS │──── 802
    │ LU TAKE-OVER INSTRUCTION    │
    │ TO DISK ARRAY APPARATUS 1   │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ CONFIGURATION MANAGEMENT    │──── 803
    │ MEANS 112 MIGRATES          │
    │ CONFIGURATION INFORMATION OF LU │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ DE-STAGE DATA OF            │──── 804
    │ SUBJECT LU ON DATA CACHE 111 │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ AFTER COMPLETION OF DE-STAGE, │──── 805
    │ INSTRUCT PATH CHANGE        │
    │ MEANS 31 OF SWITCH PATH     │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ TEMPORARILY SUSPEND         │──── 806
    │ ACCESS TO SUBJECT LU        │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ PATH CHANGE MEANS 31        │──── 807
    │ PERFORMS PATH SWITCH        │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ SWITCH CONTROL OF SUBJECT   │──── 808
    │ LU TO SWITCH-DESTINATION    │
    │ CONTROLLER                  │
    └───────────────────────────┘
                │
    ┌───────────────────────────┐
    │ RESUME ACCESS TO SUBJECT LU │──── 809
    └───────────────────────────┘
                │
        ( END OF         )──── 810
        ( LU TAKE-OVER   )
```

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FIG. 4A

FIG. 4B

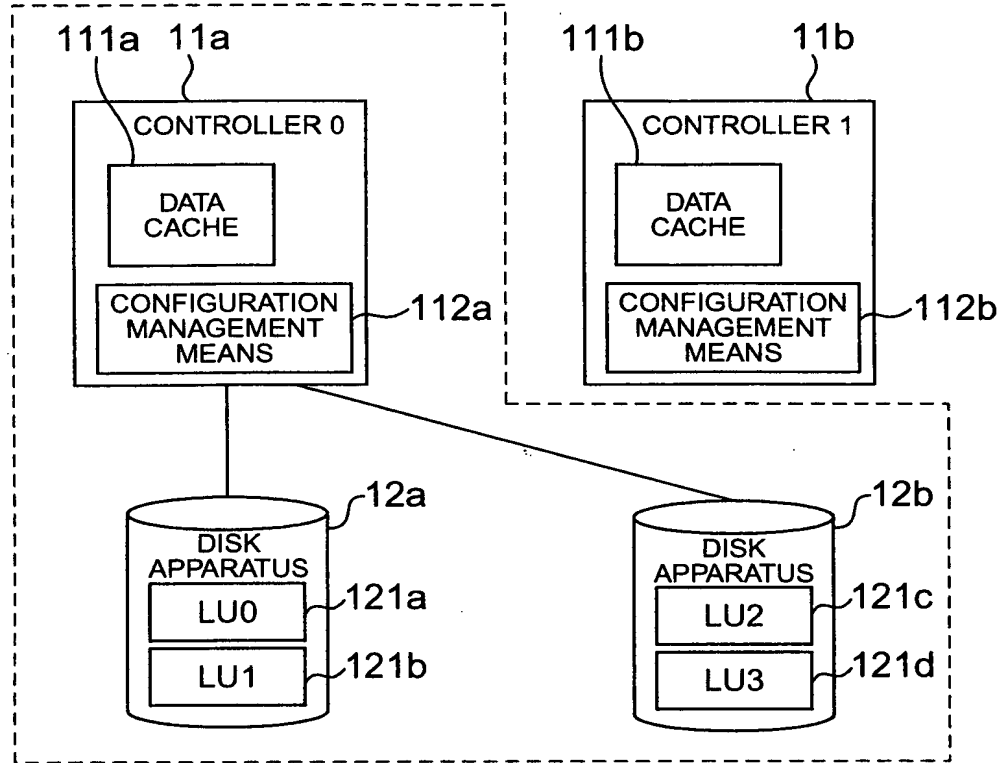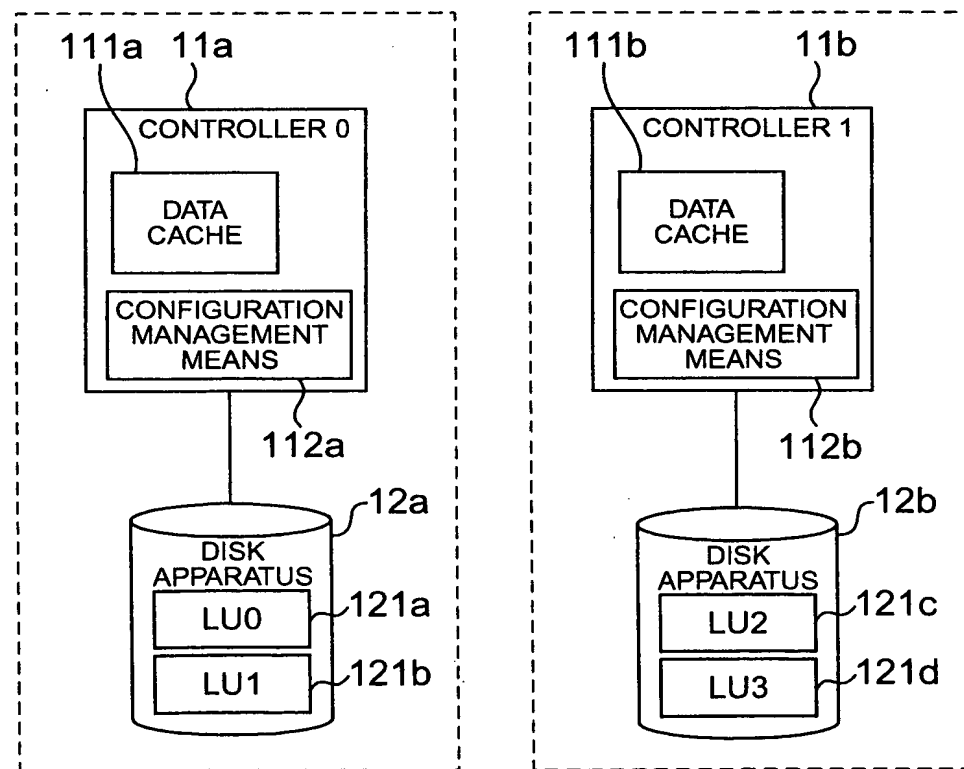Robert C. Colwell, Reg. No. 27,431   (650) 326-2400
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FIG. 5A

CONFIGURATION TABLE BEFORE TAKE-OVER

1121 x

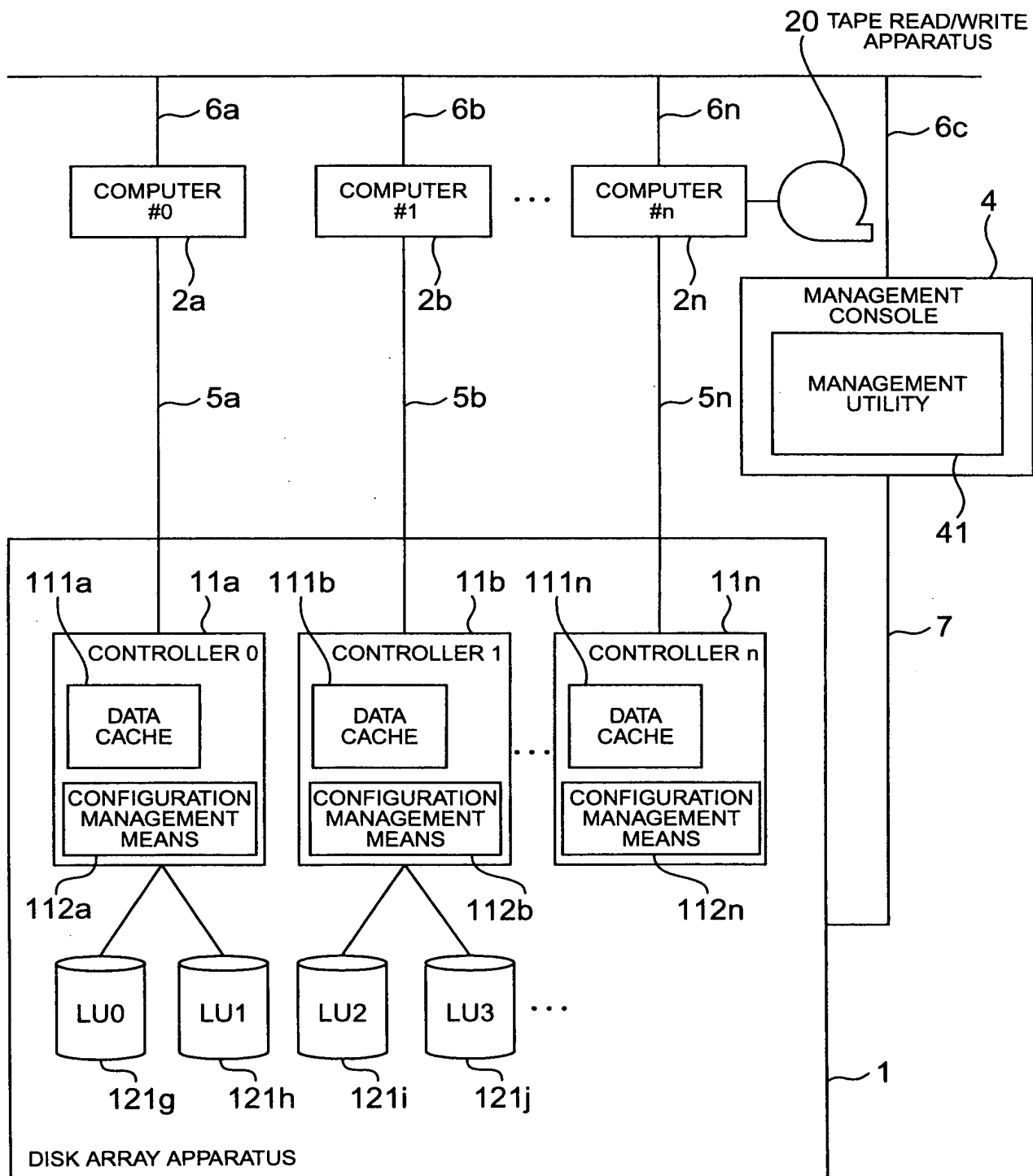| INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	1	0	0	0	⋮	⋮	⋮	⋮
1	3	0	0	0	⋮	⋮	⋮	⋮
2	0	1	0	0	⋮	⋮	⋮	⋮
3	2	1	0	0	⋮	⋮	⋮	⋮

FIG. 5B

CONFIGURATION TABLE AFTER TAKE-OVER

1121 x

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	1	0	0	0	⋮	⋮	⋮	⋮
1	3	0	0	0	⋮	⋮	⋮	⋮
2	0	0	1	1	⋮	⋮	⋮	⋮
3	2	0	1	1	⋮	⋮	⋮	⋮

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FIG. 6

20 TAPE READ/WRITE
APPARATUS

6a   6b   6n   6c

| COMPUTER #0 | COMPUTER #1 | ... | COMPUTER #n |

2a   2b   2n

4

MANAGEMENT CONSOLE

MANAGEMENT UTILITY

5a   5b   5n

41

7

111a   11a   111b   11b   111n   11n

| CONTROLLER 0 | CONTROLLER 1 | CONTROLLER n |

DATA CACHE

CONFIGURATION MANAGEMENT MEANS

112a   112b   112n

LU0   LU1   LU2   LU3   · · ·

121g   121h   121i   121j

1

DISK ARRAY APPARATUS
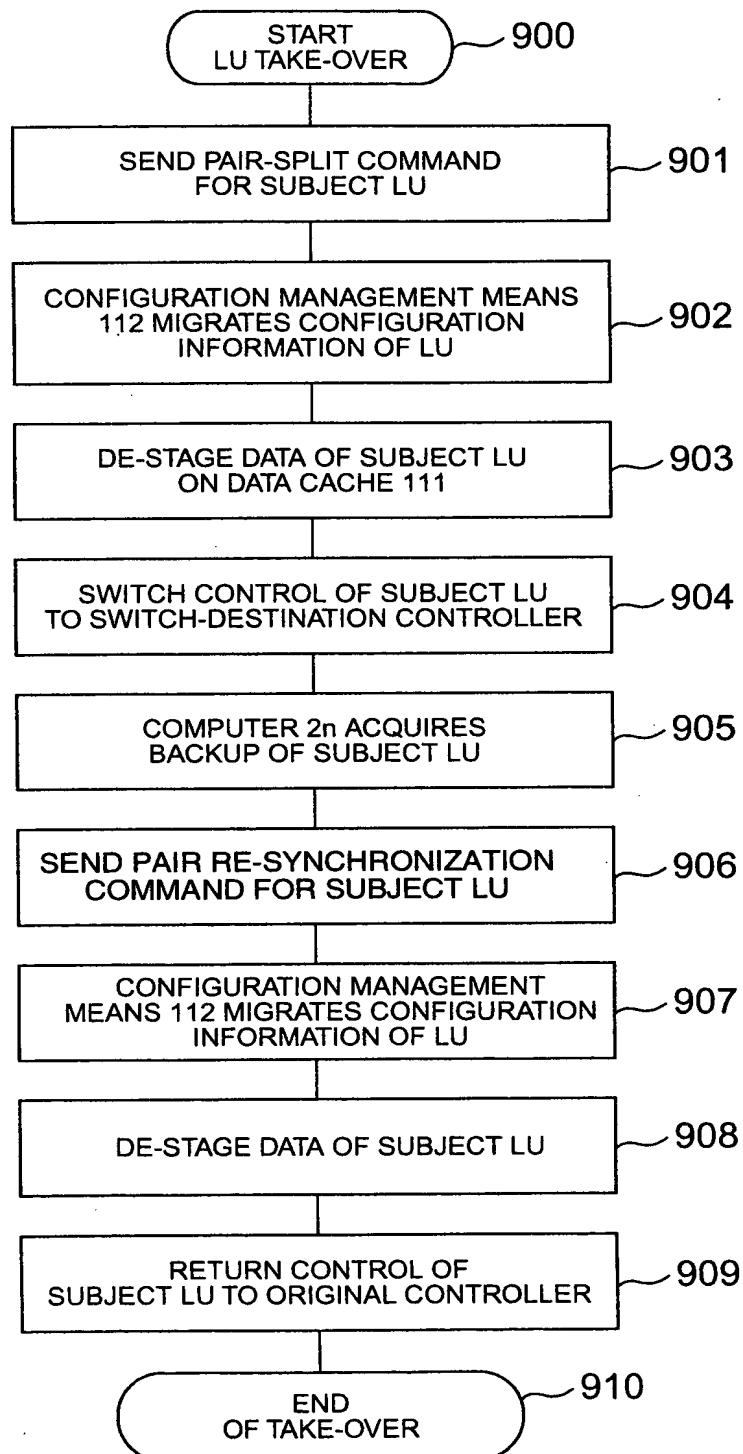
Robert C. Colwell, Reg. No. 27,431   (650) 326-2400
Applicant: Yoichi Mizuno, *et al.*
Title: Array System Capable for Taking Over Volumes B...n...
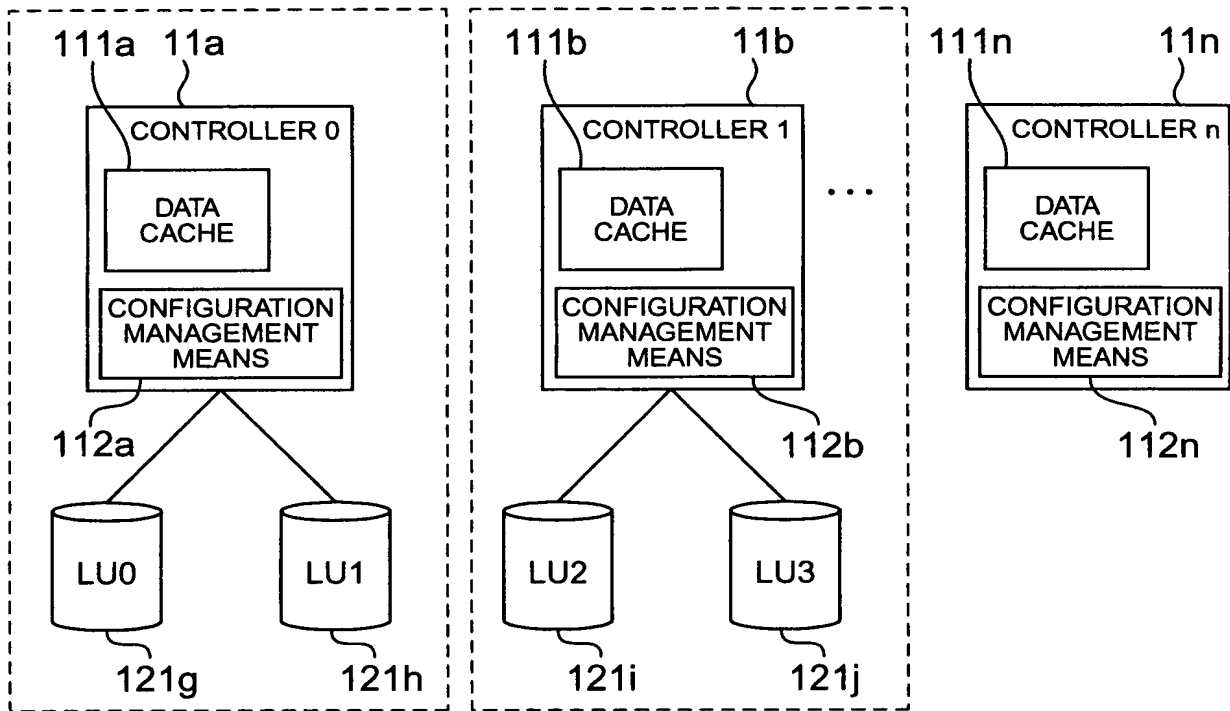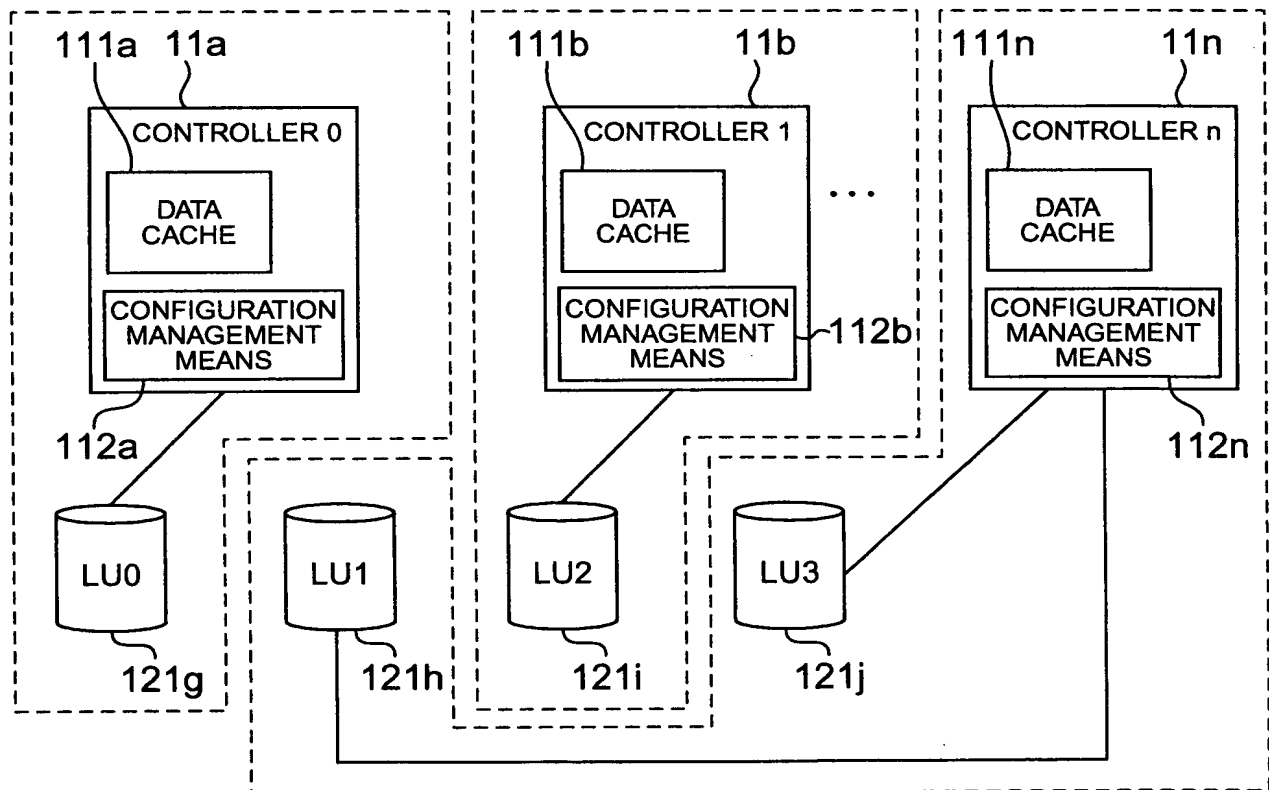**Atty Docket No.** 16869S-043800
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FIG. 7

START
LU TAKE-OVER — 900

SEND PAIR-SPLIT COMMAND
FOR SUBJECT LU — 901

CONFIGURATION MANAGEMENT MEANS
112 MIGRATES CONFIGURATION
INFORMATION OF LU — 902

DE-STAGE DATA OF SUBJECT LU
ON DATA CACHE 111 — 903

SWITCH CONTROL OF SUBJECT LU
TO SWITCH-DESTINATION CONTROLLER — 904

COMPUTER 2n ACQUIRES
BACKUP OF SUBJECT LU — 905

SEND PAIR RE-SYNCHRONIZATION
COMMAND FOR SUBJECT LU — 906

CONFIGURATION MANAGEMENT
MEANS 112 MIGRATES CONFIGURATION
INFORMATION OF LU — 907

DE-STAGE DATA OF SUBJECT LU — 908

RETURN CONTROL OF
SUBJECT LU TO ORIGINAL CONTROLLER — 909

END
OF TAKE-OVER — 910

FIG. 8A

CONTROLLER 0	CONTROLLER 1	CONTROLLER n
111a 11a	111b 11b	111n 11n
DATA CACHE	DATA CACHE	DATA CACHE
CONFIGURATION MANAGEMENT MEANS	CONFIGURATION MANAGEMENT MEANS	CONFIGURATION MANAGEMENT MEANS

112a

112b

112n

LU0   LU1   LU2   LU3

121g   121h   121i   121j

FIG. 8B

CONTROLLER 0	CONTROLLER 1	CONTROLLER n
111a 11a	111b 11b	111n 11n
DATA CACHE	DATA CACHE	DATA CACHE
CONFIGURATION MANAGEMENT MEANS	CONFIGURATION MANAGEMENT MEANS	CONFIGURATION MANAGEMENT MEANS

112a

112b

112n

LU0   LU1   LU2   LU3

121g   121h   121i   121j

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FIG. 9A

CONFIGURATION TABLE BEFORE TAKE-OVER   1121 x

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	0	0	0	0	⋮	⋮	⋮	⋮
1	1	0	N	0	⋮	⋮	⋮	⋮
2	1	0	1	1	⋮	⋮	⋮	⋮
3	2	0	N	1	⋮	⋮	⋮	⋮

FIG. 9B

CONFIGURATION TABLE AFTER TAKE-OVER   1121 x

INTERNAL LUN	EXTERNAL LUN	PORT NUMBER	CONTROLLER NUMBER		BLOCK NUMBER	RAID GROUP NUMBER	RAID LEVEL	PHYSICAL ADDRESS INFORMATION
			DEFAULT	CURRENT				
0	0	0	0	0	⋮	⋮	⋮	⋮
1	1	0	0	N	⋮	⋮	⋮	⋮
2	1	0	1	1	⋮	⋮	⋮	⋮
3	2	0	1	N	⋮	⋮	⋮	⋮

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FIG. 10
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